SPECIFICATION AMENDMENTS

Page 1, before the first paragraph:

BACKGROUND OF THE INVENTION

1. Field of the Invention

Page 1, first paragraph:

The invention relates to a system, a method and a device for producing a truss from bar-elements, which are joined or joinable, and from connection-elements located or placeable between ~~those~~ the bar elements at their joint places, ~~whereby~~ wherein the bar-elements ~~consist of~~ each comprise at least one segment of a material of high-growing plants ~~each~~, and the connection elements consist of a rigid, regenerative material. Preferably, connection-elements are provided wherever two or more bar-elements meet whose longitudinal axes are not coaxial to each other.

Page 1, second paragraph:

DESCRIPTION OF THE PRIOR ART

DE-PS 43 33 029 C2 describes a truss made from bamboo culms, which are connected to each other via connection-elements, whereby the connection-elements exhibit at least one drill hole each, in which a free end of an unprocessed bamboo culm ~~each~~ is inserted, and ~~whereby~~ wherein the connection-elements are die-casted or casted at the free ends of the bamboo culm or are fixed at the free ends of the bamboo culm by a glueing or casting agent. Thereby, ~~the~~ irregularities of the bamboo culm are compensated by the die-casting-, glueing- or casting-agent. For this purpose, the drill holes in the connection-elements have to be much overdimensioned, because the cross-sectional areas of bamboo culms can vary in a wide range. This leads to a huge demand for die-casting-, glueing- or casting-agent. Since, owing to the great volume of the used material, the mechanical properties of the die-casting-, glueing- or casting-agent are of high importance for the stability of the framework, besides their adhesive properties, too, a material of very high quality is required so that the total expenses are heavily increased. Furthermore, the assembly is very work-intensive.

Page 2, first paragraph:

~~At a generic system, the solution of this problem is achieved by the characterising features of patent claim 1. Preferred systems can be seen from the claims subordinated to said claim 1.~~

Page 2, second paragraph:

High growing plants are reinforced with fibres running in a longitudinal direction and therefore show an optimum stability for (tensile) stress along their longitudinal direction. On the other hand, since buildings produced by the system according to the invention are broken up into trusses with nodes and straight connections ~~between those~~ therebetween, it is not required that the bar-elements have a high bending strength. Therefore, fibres running slantwise or transversal with regard to the longitudinal axis of the bar element, and in particular those running in radial directions or crosswise with regard to each other, can be renounced. By using regenerative raw materials for the bar-elements, the use of expensive chemicals can be saved, which furthermore come from fossil and therefore only limited available materials. Furthermore, regenerative raw materials are built up by photosynthesis, whereby the carbon, which is required for a multitude of organic compounds, is abstracted from the carbon dioxide of the air; therefore, its climate-changing effect as a greenhouse gas is reduced. Biological materials can also be disposed of more easily without pollution of the environment.

Page 2, before the last paragraph:

SUMMARY OF THE INVENTION

Page 2, last paragraph, continuing onto page 3:

For the system according to the invention, it is of central importance that at the joint between a bar-element and a connecting element or a further bar-element, each of both bodies exhibits at least in a selected area a surface which runs along the surface generated by a cylinder, cone, prism or a pyramid, as well as at least in another selected area a surface which runs along a hollow cylinder, hollow cone, hollow prism and/or a hollow pyramid, respectively. On the one hand, these are bodies which can be produced with relatively simple processes like milling or lathing. On the other hand, this enables a connection by plugging with closely adjoining surfaces, which are suitable for ~~a~~ locking by clamping and/or glueing. By utilization of a press fit an even higher strength of ~~the~~ bonding is achievable. For instance, at a bar-element a convex hollow element (inside) is always present within a concave solid element (outside), so that two standardized surfaces lying in each other can be created easily by processing the inner and the outer side. If two surfaces, which are approximately complementary, are created at the connection-element, whereby the convex hollow element is located outside of the concave solid element (core), then the potential bonding area, and therefore the strength of the joint, can be approximately

doubled. Furthermore, a bar-element inserted into the recess is completely covered at its face side, and therefore is always firmly pressed to both bonding areas even during different expansions, e.g. caused by moisture (swelling).

Page 3, first full paragraph:

The invention recommends that the two different geometrical shapes, along which the surface of a body runs, are aligned concentrically to each other. Such an arrangement of special homogeneity can be produced in a very simple way, and~~, for instance, it~~ comes closest to the natural geometry of a bamboo culm.

Page 3, second full paragraph:

If the two different, but ~~somehow~~ symmetric shapes, along which the surface of the body runs, exhibit constant distances from each other, then the result is an isotropic structure, which permits an arbitrary rotation of the bamboo culm around its axis, and therefore offers an additional degree of freedom to enable a fine adjustment at difficult nodes of the truss.

Page 3, last paragraph, continuing onto page 4:

For clamping a bar-element at a connection-element or at an additional bar-element, a core, which is integrated ~~there~~ therewith and designed for engagement with the bar-element, can be spread~~ed~~ and thereby pressed from the inside against the inner side of the bar-element. To spread the core, a continually widening element, e.g. of the shape of a cone or of a frustum of a pyramid, can be pushed or pulled into an inner, preferably centric recess of the spreadable core. Thereby, this element transforms an actuating force of axial direction into a radial deformation of a spreadable core. For this purpose, the connection-element can have a cut-out running through its core, into which the shaft of a screw, a threaded bolt, or the like, is insertable. The latter derives its axial force from a self-locking twist with regard to another threaded element, which thereby receives the counter-force appearing during the pulling of an element with a widening cross-section into the core.

Page 4, second full paragraph:

Preferably, a connection-element has a discoid shape, for ~~instance~~ example with a circular or triangular, quadrilateral or hexagonal base. Such a connection-element is especially suitable for planar trusses, as all connections lie within one plane ~~there~~. If, for ~~instance~~ example, a crossbar to a parallel planar truss is to be made, ~~then~~ it is advisable to design the~~se~~ connections not to be perpendicular to a planar truss. The slanted anchoring structures required for this can be accommodated at a variety of locations at a discoid connection-element, but also at a further connection-element affixed to it. The thickness of such a discoid connection-element should be greater than the maximum diameter of a bar-element, so that its ending region is completely embedded in~~to~~ the connection-element. Thereby, if ~~for instance~~ bamboo is used for the bar-elements, the more sensitive inner side of the bamboo culm is not accessible from outside.

Page 5, first full paragraph:

It is in the scope of the invention that a bar-element ~~can~~ be inserted between two connection-elements, or between two other bar-elements in order to ~~prolong~~ elongate these in a coaxial direction. While in the first case both ends of the bar-element should exhibit the same plug-connection-structure (e.g. annular tongue - annular tongue), it is advisable in the latter case that principally complementary plug-connection structures are

designated at both ends (e.g. annular tongue - annular groove), so that the result ~~are~~ is normed bar-elements matching to each other.

Page 5, last paragraph, continuing onto page 6:

Moreover, the invention suggests the utilization of stems, stalks or shanks of high growing plants, which can be easily processed to elongated elements for trusses. Besides the Dicotyledones prevalent in Europe, especially the deciduous and coniferous trees, where thin trunks with a diameter up to approximately 10 or 15 cm (so-called weak-wood) are especially suitable, also plants of the species of the Monocotyledones (palm trees, grasses, etc.) can be used, as the vascular bundles of said Monocotyledones are spread so irregularly that no xylem rays appear. As a result, the fibres are not arranged in a regular pattern side by side. As all fibres run parallel to each other, a configuration ~~for instance~~ in isogonal rows or even in one single ring would lead to layers of bonding agent which are not reinforced, along which a peeling-off, i.e. the formation of cracks would be considerably facilitated. Therefore, such fibreless central or xylem rays should be avoided where possible. Further, an increase of the density of the fibres is desirable from the center to the outer circumference of the bar-element, where naturally the highest forces appear in the case of still appearing flexural stress. Following this idea of the invention, among the family of the Gramineae one will find the so-called giant grasses or bamboo

plants, which have the further advantage of an increase of vascular bundles or vascular fibres at the outer circumference and therefore feature a high flexural strength despite ~~of~~ fibres running in the longitudinal direction. Certainly, the stems or stalks of bamboo plants are divided in their longitudinal direction into nodes (node levels) and into internodes (tube-like areas). The cross-linking of the fibres at the nodes ~~shall~~ increases the elasticity of the living bamboo; however, in harvested and dried bamboo those can cause tensions, and therefore they should be pierced. An excessive impairment of the stability of such bamboo culm is not to be expected therefrom. As the internode-segments have a structure of extreme homogeneity and as the nodes as centres of growth constitute only thin layers, the properties of the tubes are dominated by the segments, i.e. the internodes. Merely the tensile strength is decreased in the nodes, but not compressive, shear and flexural strength, so that the stability of a truss which is predominately subjected to compressive forces does not suffer from this.

Page 6, first full paragraph:

Some bamboo plants grow within one year to a height of up to 30 meters, while in the following years only a lignification without additional growth occurs. With the high-growing bamboo-plants the diameter of the trunk is between 5 and 20 centimetres, and the wall-thickness of the tube is approximately between 0.5 and 8.0 centimetres. With the exception of the regularly appearing nodes, Bamboo has no defects like ~~they~~ are found at Dicotyledones, for instance in the form of starting points of branches (so-called knotholes), and which additionally impair the stability. Due to its high mechanical strength, a bamboo culm can absorb high tensile and/or compressive forces in a longitudinal direction, which are comparable to those of steel in the area of the internodes. The flexural stress is only limited by a tendency towards the creation of bucklings when high flexural forces are applied. Although bamboo plants ~~are~~ grow~~ing~~ slightly more straight than most types of trees, almost always inestimable curvatures are present, as well as considerable irregularities regarding the diameter of the tube. For this reason, until now bamboo culms were always bound together with strings, fibres or the like, which again is absolutely insufficient for the production of a framework or truss, as with this no forces in longitudinal direction of the involved bamboo culms can be transmitted.

Page 6, last paragraph, continuing onto page 7:

As the outside of the stem is covered by a hard, water-repellent and extremely lasting layer, which contains silicates, while the inside bears a wax-like coating, these areas cannot be wetted by many adhesives ~~and therefore~~ which would impair the durability of a bonded joint. Furthermore, as these layers are relatively smooth, the achievable frictional connection is relatively low, and so the invention suggests to ablate these layers, but only at an area which is not subjected to the atmosphere, so that no water can enter at the areas which are not protected against moisture ~~anymore~~.

Page 7, first full paragraph:

The shape of the bar-elements ~~themselves~~ may be manifold. According to the chosen material, a bar-like structure, i.e. with a massive core ~~like it~~ results, for instance, from deciduous or coniferous wood, ~~can~~ may be preferred, or a tube-like structure, which presents itself when using bamboo culms. Furthermore, core drilling of solid log wood bars has the advantage of a steady drying across the diameter with consequently steady and therefore crack-free shrinking.

Page 7, second full paragraph:

A further aspect is that bamboo is a biological material, which shrinks or swells under the influence of its environmental conditions and therefore tends to develop cracks in the course of time, for example when a rigid end-piece~~, for instance~~ made from metal or plastic, is inserted. This in turn would have disastrous consequences, as afterwards the water-repellent surface would be interrupted and after that water could enter and cause rottenness, or the like. For this reason, the invention prefers the use of connection-elements of a comparable biological material like, for instance, Dicotyledones, especially deciduous or coniferous wood. Those exhibit similar reactions to changed environmental conditions as Monocotyledones and therefore can shrink or swell in the same fashion, so that the inner tensions in the material remain comparably low. However, to insure this, any intermediate pieces between the Monocotyledone tubes and the connection-elements have to be avoided as possible. Therefore, the invention provides a direct joint, either as a plugging, clamping and/or a bonding joint. On the other hand, such joining technique which is industrially applicable with justifiable effort requires standardized contact surfaces, which are not offered by a naturally grown giant grass. This is remedied by the invention in that initially the irregular ends of a bamboo culm which is to be used are treated in such a way that surfaces running along well-defined geometric bodies are created. This work step can be integrated with the aforementioned ablating of the outward surface layers in the proximity of the joining area.

Page 8, first full paragraph:

As the joint element is connected, for ~~instance~~ example, by a sealing adhesive with a tube-like bar-element, ~~for instance~~, such as a bamboo tube, and features internally connected channels which lead to the cavities of the connected, tube-like bar-elements, ~~whereby~~ in the case of bamboo tubes their nodes are drilled, so a closed cavity with an intentionally influenced sub-climate is created within a framework or truss produced in such way. This sub-climate can be influenced in a multitude of ways in order to control and/or monitor the behaviour of the truss, or to keep potentially destroying influences like infestation of pests from the inside, fire or the like, away from the truss. For this it has proven pertinent if at least one joint element and/or tube-like bar-element comprises a port at which gases, foams and/or liquids can be fed into the cavity of the system, for example, moist or dry air to keep the bamboo flexible through a controlled climate, further toxins, as well as hot, cold or compressed air for pest control, and fire extinguishing agents ~~like for instance~~ such as nitrogen, foams or water, or the like.

Page 8, second full paragraph:

To solve the ~~set~~ problem, a generic manufacturing process is embodied according to the ~~characterizing part of the co-ordinated~~ process ~~claim~~ described herein. ~~In the claims subordinated to that further, preferred features of the process according to the present invention are described.~~

Page 8, last paragraph:

The requirement of standardized surface areas which is at first not fulfilled with naturally grown materials, ~~for instance~~ such as wood or bamboo culms, is indispensable for their employment in the scope of the production of a truss, so that the individual parts fit exactly to each other and are ~~pluggable~~ interconnectable in ~~the~~ a desired way. Furthermore, it is of great benefit if ~~also~~ the alignment of the standardized end areas relative to each other is exactly specified. Especially favourable conditions are created if the end areas are machined in such a way that the geometric bodies defining their surfaces, at least in selected areas, exhibit at least one axis of symmetry each which can be arranged in mutual relation, for instance to share a common alignment. Only through this does it become~~s~~ possible to comply with precisely specified angles of inclination of bar-elements in order to bring them together at predetermined nodes of the truss.

Page 9, first paragraph:

These requirements enable the production of trusses according to plan which are calculated in advance with regard to their statics, ~~what~~ which is the more important the bigger a building is. Again, the possibility of the use of (wooden) bars and/or (bamboo) tubes of variable length is not impaired, as the machining of the ends can take place at the construction site after a (tube-like as applicable) bar-element ~~was~~ is cut to the desired length. Further, at least one lateral surface area has to be created at a connection-element, which permits the plugging with a lateral surface of the end of a bar-element. The diameter of this lateral surface and therefore the selection of ~~the~~ a tool required for its creation is determined by the classification, if applicable, of the end of the concerned wooden bar or bamboo tube. As this is determined usually only directly preceding to the mounting of the concerned bar-element, the suitable plug-structure is formed at the concerned connection-element only on the site.

Page 12, last paragraph:

If at least one tubular bar-element, especially bamboo tube, and/or preferably at least one connection-element, is provided with a port to the cavity within the tubular bar-elements and connection-elements, different media can be conducted into this cavity as necessary. In order to permit an exhaustion of a medium which is already contained within the cavity, for instance air, it is advisable to always designate at least two such ports at a cavity ~~closed apart from that~~. ~~Those~~ Such ports should be arranged at distant places to create defined flow conditions. Thereby, it has proven beneficial to arrange one such port at the lowest position and as necessary another port at the highest position of a section of a truss, so that on the one hand liquids, and on the other hand gases each can be completely removed from the cavity.

Page 13, first paragraph:

~~An apparatus for carrying out the process according to the present invention is described by the characterising features of the independent apparatus claim.~~

Page 13, second paragraph:

The utilization of ~~such~~ an apparatus for carrying out the process simplifies the production of a truss ~~insofar,~~ as thereby a time-consuming, manual individual treatment ~~respectively rework~~ of the different nodes of the truss can be omitted because surface areas which are compatible to each other are created. As a machining apparatus according to the present invention is configured as an ablating tool, especially as a cutting tool, it can be configured to be mobile due to its small required space, and therefore it can be easily transported to the construction site ~~without problems~~.

Page 13, third paragraph:

An apparatus for machining of the ends of a bar-element ~~is characterised by~~ comprises a device for clamping a bar-element in such a way that both of its ends are as concentrically as possible aligned to a longitudinal axis of the machining apparatus. Thus, the actual machining-tools always come across a bar-element which is to be processed at one and the same predetermined position, so that they can be adjusted with regard to the body of the machine in a defined way. Thereby, in general, a holding and/or fixing device for each treatment tool is placed at each end of the clamping device. Such a fixing device can, for example, be configured as a slide, which is moveable in a defined way through a guide in the feeding direction along the longitudinal axis of the machining apparatus, and which ~~on the other hand~~ is carrying the actual

holding and/or mounting for the machining tool and/or its drive motor.

Page 14, last paragraph, continuing onto and through pages 15 and 16:

BRIEF DESCRIPTION OF THE DRAWINGS

Further features, details, advantages and effects on the basis of the invention result from the following description of preferred embodiments of the invention as well as from the ~~drawing. There,~~ drawings, wherein:

Fig. 1 ~~shows~~ is a perspective view showing ~~of the~~ a first connection-element of a truss-system according to the present invention;

Fig. 2 ~~shows~~ is a perspective view showing a modified embodiment of a connection-element in an illustration corresponding to ~~fig.~~ Fig. 1;

Fig. 3 is a section through two connection-elements according to ~~fig~~ Fig. 2 and fixed to each other;

Fig. 4 ~~shows~~ is a perspective view showing a modification of the connection-element ~~from fig~~ of Fig. 2 ~~in a perspective view~~;

Fig. 5 is an exploded view of a pluggable connection with the connection-element from ~~fig.~~ Fig. 4, as well as a partly cut and broken bamboo tube;

Fig. 6 shows the ~~composition from fig.~~ elements of Fig. 5 after assembly of the connection;

Fig. 7 ~~shows~~ is an elevational view showing a different configuration of the invention;

Fig. 8 ~~shows~~ is a perspective view showing a connection-element, ~~which is for instance~~ usable as a base element, ~~in a perspective view~~;

Fig. 9 is a side ~~view to~~ elevational view of a planar truss, built with the system according to the present invention;

Fig. 10 ~~shows~~ is a side elevational, partly sectional view of a connection-element from the truss in ~~fig.~~ Fig. 9 ~~in broken and partly cut view~~, together with a tool applied at a lateral surface to create ~~the~~ a cavity for receiving a bamboo tube;

Fig. 11 is a ~~longitudinal~~ section through the tool ~~from fig.~~ of Fig. 10;

Fig. 12 is a broken side ~~view to~~ elevational view of an apparatus for clamping and processing the ends of a bamboo tube;

Fig. 13 is a perspective view of a clamping device of the apparatus ~~from fig.~~ of Fig. 12;

Fig. 14 is a front view in the direction of the arrow XIV to the tool ~~from fig.~~ in Fig. 12; ~~as well as~~ and

Fig. 15 is a section through two coaxially joined bar-elements.

Page 16, before the first full paragraph:

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The perspective view of a ~~connecting~~ connection element 1 in ~~fig.~~ Fig. 1 ~~is intended to~~ illustrates ~~the~~ basic principle of the present invention. ~~An~~ The arbitrarily or randomly shaped connection-element 1 exhibits at its surface 2 one or more three-dimensional structures 3 for the connection of one bamboo tube 4 each. By assembly of multiple bamboo tubes 4 at such a connection-element 1, the latter becomes a node in a truss or framework 5 (Fig. 9).

Page 16, second full paragraph:

The connection-element 1 ~~from fig.~~ in Fig. 1 has the basic shape of a rectangular parallelepiped with four equally sized lateral faces 6 and one square top and bottom side 7 ~~each~~. The epipedal-shaped connection-element 1 consists of many layers of plywood 8 glued on top of each other with crossed direction of fibres ~~each~~. As these glued layers of plywood 8 run parallel to the square top or bottom side 7, the connection-element 1 has a high tensile strength in directions running parallel to those planes.

Page 16, last paragraph:

As is further shown in ~~fig.~~ Fig. 1, each structure 3 for the mounting of a bamboo tube 4 has approximately the shape of an annular recess 9 with two bounding surfaces 10, 11 in the shape of lateral surfaces of cylinders which are concentrical to each other. The outer diameter of ~~this~~ the recess 9 corresponds approximately to the outer diameter of the concerned bamboo tube 4, and the constant distance of the bounding surfaces 10, 11 with the shape of lateral surfaces of cylinders corresponds approximately to the standardized maximal thickness of an end area of a bamboo tube 4 which is insertable into ~~this~~ the recess.

Page 17, first paragraph:

With the embodiment according to ~~fig.~~ Fig. 1, the ends of the bamboo tubes 4 are glued into the annular recesses 9 of the connection-element 1, so that a rigid and nondetachable connection is obtained. As ~~fig.~~ Fig. 1 further shows, a cylindrical core 12 remains within each annular recess 9, which is adhesively connected to the inside of a bamboo tube 4 and thus additionally fixes and stabilizes ~~this~~ the bamboo tube 4. As wood exhibits comparable temperature coefficients and swelling phenomena due to moisture as bamboo, a formation of cracks is thus effectively prevented.

Page 18, first full paragraph:

~~The~~ A connection-element 14 ~~from fig.~~ , shown in Fig. 2, has a cubical shape and is modified insofar as ~~there~~ a structure 3 for connecting a bamboo tube 4 ~~each~~ is provided only at the top and bottom sides 15, while at ~~the~~ lateral faces 16 only central drillings 17 are provided which penetrate the connection-element 14. ~~This~~ The connection-element 14 ~~also~~ consists of layers of plywood 18 glued to each other, which are running perpendicular to the top or bottom side 15.

Page 18, second full paragraph:

The connection-element 14 serves mainly for the extension of bamboo tubes 4. In order to also realise nodes of a truss ~~with this,~~ two or more such connection elements 14 are fixed to each other, as shown in ~~fig.~~ Fig. 3. For this purpose, the connection-elements are put together in the desired orientation in such a way that one drilling 17 each is aligned with the other. A screw or threaded bolt 19 is inserted ~~in~~ into the two aligned drillings and is locked at both sides with a threaded element 20, so that the connection-elements 14 are fixed to each other.

Page 18, third full paragraph:

~~Now bamboo~~ Bamboo tubes 4 can be inserted into the accessible connection structures 3 and glued there in the desired manner. This arrangement has the further speciality, that at such node of a truss a rotation is possible for adaptation to framework structures running in slanted directions with regard to each other.

Page 19, first paragraph:

The connection-element 21 ~~from fig.~~ shown in Fig. 4 has the same cubical shape as the connection-element 14. ~~As with this, the~~ The three-dimensional structure 22 for the connection of a bamboo tube 4 also comprises an annular recess 9 with two bonding surfaces 10, 11 which are concentrical to each other. ~~The~~ A core 23 ~~remaining~~ disposed within ~~this~~ the recess 9 is penetrated by a central drilling 13. However, contrary to the connection-element 14, the core 23 is provided with two slittings 24 along the longitudinal axis of the drilling 13, which extend approximately to the base of the core 23 respectively of the annular recess 9, so that ~~the~~ remaining quarters 25 of the core can spring to the outside in a limited way.

Page 19, second paragraph:

The central drilling 13 in the core 23 exhibits a conical countersinking 26, in which the head of a countersunk screw 27 with a machine thread 28 inserted into the drilling can be positioned. A threaded element 29 is screwed on this thread 28 at the ~~outer surface~~ bottom side 7 of the connection-element 21 ~~opposite to the connection unit 22~~. After the insertion 30 of a bamboo tube 4 into the annular recess 9 ~~this~~ the threaded element 29 is firmly secured. Thereby ~~the~~ a head 31 of the screw ~~31~~ 27 is pushed deeper and deeper into the conical countersinking 26 and thereby spreads the quarters 25 of the core to the outside. ~~Those~~ The quarters 25, in turn, are pressed with their ~~outsides~~ bottom surfaces 11 against ~~the~~ an inner side 32 of ~~the~~ a lateral surface 33 of a bamboo tube 4, clamping it tightly. Therefore, the gluing of a bamboo tube 4 is not required with this type of connection 21, and the connection can always be detached in a non-destructive way. Instead of a countersunk screw 27, a conical bolt, or the like, can be used~~, too~~.

Page 19, last paragraph:

A further connection-element 34 is shown in ~~fig.~~ Fig. 7~~. This has~~ having the shape of an annulus 35 with rectangular or square cross-section. At ~~the~~ an outer surface 36 of ~~this~~ the ~~ring~~ annulus 35 six three-dimensional structures 22 are located equidistantly distributed over the circumference for the connection of one bamboo tube 4 each. The three-dimensional connection structures ~~22~~ 34 are identical to the ~~concerned~~ structures 22 of the connection-element 21 regarding their topology and function, so that a cross section through the annular ring 35 at a connection point ~~22~~ 21 rather corresponds to ~~fig.~~ Fig. 6, with the exception of the fact that here the crossways running drilling 17, as well as a connection structure at ~~the~~ an inner side 37, of the ring is missing.

Page 20, first paragraph:

The he ring 35 offers the advantage~~, that~~ of an almost arbitrary number of connection points - ~~only~~ one up to six ~~or~~ and possibly ~~even~~ more - can be provided as required, whereby all connections ~~22~~ can be implemented to be detachable.

Page 20, second paragraph:

With such a ring ~~for instance~~ 35, planar trusses or frameworks 5 can be produced, ~~like~~ as shown in ~~fig.~~ Fig. 9~~. Thereby,~~ wherein connection-elements 38 of the kind illustrated in ~~fig.~~ Fig. 8 serve as base elements~~. Those consist~~ consisting of one cuboid 39 each, whose length is approximately double ~~than~~ its height and width. ~~They~~ The cuboid 39 features a central, continuous vertical drilling 40 for the fixing by screws to a foundation 41, or the like. At ~~the~~ an area of their upper narrow edges 42 a three-dimensional structure 43 is provided ~~each~~ for the connection of a bamboo tube.

Page 20, third paragraph:

The structure 43 corresponds to the structure 3 of the ~~embodiments~~ connection elements 1 and 14 regarding its function, where a bamboo tube is not fixed by clamping, but by glueing. However, here the annular recess 44 and the drilling 45 concentrical to it are not located perpendicular to a surface of the connection-element 38, but inclined under an angle of 30° to the outside diverging from the vertical drilling 40 to the top. Moreover, the structure 43 overlaps the upper narrow edge 42, so that in particular the face side of ~~the~~ a core 46 of the connection structure 43 is composed of two partial surfaces 47, 48 perpendicular to each other, which form a remaining part of the original surface 49, 50 of the connection-element 38.

However, ~~this fact~~ such does not impair the function of the three-dimensional structure 43 as a connecting and fixation point for a bamboo tube 4.

Page 20, fourth paragraph:

As shown in ~~fig.~~ Fig. 9, initially a series of ~~joint~~ connection elements 38 is screwed or otherwise fixed to a foundation 41 in order to build a truss or framework 5. After the connecting structures 43 are brushed with glue, the ends of bamboo tubes 4, diverging from each other to the top at together 60°, are inserted. Two bamboo tubes 4 are joined at their adjacent upper ends 51 by one nodal connection-element 52 each.

Page 20, last paragraph, continuing onto page 21:

The connection-element 52 forming a node of the truss 5 has a similar base shape as the connection-element 1, however, unlike that it has a hexagonal base area with a constant thickness, which is greater than the maximum diameter of a bamboo tube 4. Like all other connection-elements 1, 14, 21, 34, 38, this also consists of layers of plywood crosswise laminated together, whose planes are parallel to ~~the~~ hexagonal base faces 53. Accordingly, the circumference 54 of such connection-element 52 consists of six equally sized rectangles.

Page 21, first paragraph:

Before the curing of the glue, adjoining nodal connection-elements 52 are connected by one bamboo tube 4 running in horizontal direction ~~each~~, which is glued at the same time. Thus, the first layer of the truss 5 is created. As soon as this is stiffened due to the curing of the glue, which can take approximately 15 minutes if wood glue is used, another layer of the truss can be put on it according to the same principle, as ~~it is~~ indicated ~~at~~ in ~~fig.~~ Fig. 9. The completed truss 5 consists of many identical cells which have the shape of an equilateral triangle, and obtains thus optimal stability. Of course, another, also three-dimensional structure of a truss 5 can be chosen if required, for ~~instance~~ example in the form of two planar and parallel trusses connected to each other, or the like. Favourably, the bamboo tubes 4 always have a length of only approximately 1 to 2 m, so that no buckling effects ~~can~~ appear due to ~~a~~ excessive flexural stress at a too long bamboo tube 4.

Page 21, last paragraph:

The cutting tool 56 comprises a rotating tool-head, which features a connection for a driving engine at the back. The connection can be embodied ~~for instance~~ as a cylindrical appendix 58 coaxial to the longitudinal axis 57 of the tool ~~57~~ 56, which is insertable into the chuck 59 of a hand drilling machine. With the illustrated embodiment, this cylindrical mounting appendix 58 is a part of the shaft of a (wood) drill 60, with which the central ~~cavities~~ drillings 13, 45 of ~~a~~ connecting structures 3, 22, 43 are drilled. An approximately bell-shaped tool-component 62 is detachably fixed at the shaft of ~~this~~ the drill 60 by means of a clamping screw 61.

Page 22, first paragraph:

~~This~~ The bell-shaped tool-component 62 consists of a part 63 which is shaped like an annular disc, and a part 64, which is shaped like the lateral surface of a cylinder and extends from the periphery of the first part to the front, carrying at its front side ~~the actual~~ cutting tools 65 for the creation of the annular recess 9 of the connection structure 3, 22, 43. The part shaped like an annular disc has a inner diameter which corresponds to the diameter of the drill 60, and an outer diameter, which approximately corresponds to the outer diameter of a bamboo tube 4. At its backside 66, ~~this~~ part 63 is provided with an appendage 67 of reduced cross-section, but likewise ~~cylindrical~~ cylindrically-shaped, through which a threaded hole with radial direction extends to accommodate the

clamping screw 61. Thus, the part 63, shaped like an annular disc, can be plugged over the shaft of a drill 60, whereby it is aligned perpendicularly to the longitudinal axis 57 of the drill ~~57~~ 60 by means of a fit almost free of play, in order to be locked in this position afterwards by tightening the clamping screw 61.

Page 22, second paragraph:

The part 64, shaped like the lateral surface of a cylinder, can be integrally manufactured with the part shaped like an annular disc, for instance caste~~d~~ together with the latter, or, for example, it can be produced from a tubular part, which is screwed to the part 63 shaped like an annular disc from the backside 66 of this part with screws 68 parallel to the axis 57 of the drill ~~57~~ 60, as shown in ~~fig.~~ Fig. 11. In the area of its front side the part 64 ~~shaped like the lateral surface of a cylinder~~ is furnished with a number of equidistantly distributed rectangular recesses, so that approximately the shape of a crown is obtained.

Page 22, last paragraph:

At multiple cutting areas 69 of the part 64 ~~shaped like the lateral surface of a cylinder~~, which are parallel to the longitudinal axis 57 of the tool ~~57~~ 60, one cutting tip 70 ~~each~~ is fixed, ~~preferable~~ preferably with a screw 71 passing through a central bore of the concerned cutting tip 70. As shown in ~~fig~~ Fig. 11, it is the object of this cutting tip 70 to cut the annular recess 9 into the body of a connection-element 1, 14, 21, 34, 38 during the rotation of the ~~processing~~ cutting tool 56, as well as under the influence of a superimposed feeding motion 72. Thereby, the drill 60, whose front area is located before the cutting tip 70, can take over a guiding function.

Page 23, second paragraph:

As previously explained, the growth of a bamboo tube 4 is always more or less irregular. As the annular recess 9 of a connection structure 3, 22, 43, according to the present invention, is ~~optimum~~ optimally round due to the use of a ~~processing~~ cutting tool 56 revolving around an axis 57, normally a bamboo tube 4 cannot be inserted flush with it~~:~~. Either the bamboo tube does not fit at all in the designated recess 9, or it is seated much too tight or - if the recess is dimensioned larger - too loose, so that no clamping effect is created. ~~respectively vast~~ Vast quantities of glue are required, which not only increases the costs, but also the labour time due to the increased curing times.

Page 23, last paragraph:

For this reason, the invention provides that ~~the~~ ends 73 of bamboo tubes 4, which have been cut to the desired length, are treated before they are mounted in a truss or framework 5. Therefore, a standardized geometry has to be applied to ~~those~~ such tubes, so that they fit into the designated recesses 9 of the concerned connection-elements 1, 14, 21, 34, 38. However, in general this is not sufficient for the production of an exactly pre-planned truss 5, as often both ends 73 of a cut bamboo tube 4 are not coaxial to each other. This, in turn, would lead to displacements and/or tensions within a truss 5, which would gradually sum up themselves during the course of the construction, so that a bigger building would become more and more skewed with the progress of the construction. Therefore, it is the additional object of an apparatus 74 for the machining of the ends 73 of a bamboo tube 4 to assure that not only the two end areas 73 of a bamboo tube 4 exhibit surfaces 75, 76 running along lateral surfaces of cylinders (with other types of connections ~~for instance~~ such as lateral surfaces of cones) in selected areas, but also that the longitudinal axes of those cylindrical (conical, etc.) areas of both ends 73 are aligned to each other in coaxial relation. An apparatus 74, which is capable of this, is shown in ~~fig.~~ Fig. 12.

Page 24, first paragraph:

In ~~the~~ a strict sense, only approximately half of ~~this machine~~ the apparatus 74 is visible in Fig. 12; the left part of the ~~machine~~ apparatus, which is laterally reversed with regard to ~~the~~ a symmetry plane 77, ~~was~~ is omitted for reasons of space. The ~~machine~~ apparatus 74 basically consists of four components~~:~~. An elongated, rigid profile 78, which is used as a reference for the longitudinal axis of the ~~machine~~ apparatus 74 as well as for mounting of the further components of the ~~machine~~ apparatus. Approximately in the middle of the profile 78, a device 79 for clamping a bamboo tube 4, which is to be processed, is mounted to it. ~~At last there~~ There are two processing devices 80, which are located at both sides of the clamping device 79, and which are likewise supported by the profile 78. In the scope of a simpler version, one processing device 80 can be saved if the remaining one can be relocated to the other end of the profile 81 in a simple way, or, for ~~instance~~ example, if the clamping device is designed to be rotatable by 180^0 together with a clamped bamboo tube 4.

Page 24, second paragraph:

A commercially available constructional element can be used as the profile 78. Preferably, this consists of a four-cornered profile with a square cross-section, whose long sides 82 each comprise a T-shaped undercut mounting groove 83 ~~each~~, which is running along the longitudinal direction of the profile~~, compare fig. 13~~. Blocks, which are not shown, can be mounted at ~~those~~ the grooves 83, for example at both end areas of the profile to support the ~~machine~~ apparatus 74.

Page 24, last paragraph, continuing onto page 25:

A set of grippers 84 is shown in ~~fig.~~ Fig. 13. At both ends of the supporting profile 78, a bolt 87 (Fig. 13), which is parallel to the supporting profile 78, ~~each~~ is fixed in a ~~not~~ non-rotatable manner by means of lateral fastening angles 86 (Fig. 12). Onto ~~those thus~~ the fixed bolts 87, there is plugged an upright standing plate 88 ~~each~~ (Fig. 13), which comprises a through-hole for this purpose of a diameter corresponding to the diameter of the bolt. The plates 88 are limited by the concerned fastening angle 86 and are fixed at the other end of the concerned bolt 87 by a pinion 89 ~~each~~ which is non-turnably fixed to the bolt, for instance crimped, so that they are able to pivot around the concerned bolt 87, but not to loosen from it. The plates 88 are embodied as two-armed levers with a shorter arm 90 which protrudes downwards from the concerned mounting hole, and a longer arm 91, which protrudes upward. Both lower lever arms 90 are connected with each other through a

tension spring 92, which is routed under the supporting profile 78, and are thus pulled to each other, until they are stopped by the long side 82 of the carrying profile 78. In ~~a~~ such a case, the upper arms 91 of the plates 88 take a maximum spreaded position.

Page 25, first full paragraph:

Approximately at the upper end of each plate 88, another through-hole is located for a rotating axis 93, which is pivoted there. Each of ~~these~~ the rotating axes 93 carries a pinion 94 at one end, and, at the other end, a plate 95 whose circumference comprises a concave side 96, for ~~instance~~ example with a course like a hyperbola.

Page 25, second full paragraph:

The ~~gear~~ pinion 94, as well as the plate 95, each are ~~unturnably~~ fixed ~~at~~ on the rotating axis 93, ~~respectively~~ as by crimped, clamped (clamping screw), soldered and/or welded. Otherwise, the pinion 94 is coupled with regard to the rotational movement with the pinion 89 at the stationary bolt 87 through a toothed belt 97, which is kept tense by a device 98. Thus, it is achieved that the spatial orientation of the upper plates 95 is kept independently from the pivoted position of the lower plates 88. This function has the same effect as a parallel guide by means of a leverage with two pivotable bars parallel to each other.

Page 25, fourth full paragraph:

An appendix, ~~for instance~~ such as a screwed bolt 99, protruding downwards ~~each~~ is provided at the lower face sides of the lever arms 90 of the plates 88 for the actuation of ~~such set of~~ the grippers 84. Here, the actuating ~~device~~ mechanism 85 engages.

Page 25, last paragraph, continuing onto page 26:

The actuating ~~device~~ mechanism 85 comprises a pneumatic cylinder 100 (Fig. 12) which is located under the supporting profile 78 and which is aligned parallel to it. A conical apex 104, 105, each facing axially to the outside, is fixed at the casing of the cylinder 101, as well as at the piston through a rod 102, 103 each of which is coaxial to the axis of the cylinder. The two rods 102, 103 each pass through one bearing block 106, 107 ~~each~~, through which the complete actuating ~~device~~ mechanism 85 is supported at ~~the~~ an underside of the supporting profile 78, so that it is movable in its longitudinal direction in a guided manner.

Page 26, first full paragraph:

As the casing of the cylinder 101 itself is not fixed, it can move in the longitudinal direction of the supporting profile 78 in a limited way. If the pneumatic cylinder 100 is extended pneumatically, the conical apexes 104, 105 move in between the pair of appendices protruding ~~downside~~ downwardly, in particular in between the bolts 99, of one set of grippers 84 each, and press those apart. Thus, the upper levers 91 are pivoted to the inside, and the bamboo tube 4 is clamped in the area of both of its ends 73 in between two concave ~~brackets~~ sides 96 of plates 95~~, 96, each~~. Thereby, a centrification of the two ends 73 symmetrical to the vertical longitudinal plane of the supporting profile 78 takes place, because the conical apexes 104, 105 act evenly on the two arms 90 of a set of grippers 84. The centrification with regard to the height is obtained through the concave shape of the clamping ~~brackets~~ sides 96. Thereby, the exact dimensions, for instance the diameter of a bamboo tube 4, are not important, as the pneumatic cylinder 100 moves in the longitudinal direction by itself until equal forces act on all arms 90.

Page 26, second full paragraph:

A bamboo tube 4 centred in such manner is afterwards machined in the area of its both ends, i.e. surface areas 75, 76, which are projecting above a predetermined measure ~~are ablated~~. This is achieved by one ~~machining~~ processing device 80 ~~each~~.

Page 26, third full paragraph:

Each ~~machining~~ processing device 80 comprises a slide 108, which is movable along the supporting profile 78, having a device 109 for mounting a drilling machine 110 under simultaneous alignment of the drill chuck coaxial to a processing axis, which is running in the ~~centre~~ center above the supporting profile 78, as well as at a height determined by ~~that~~ the area of the concave clamping brackets 96, which is receded the most.

Page 26, last paragraph, continuing onto page 27:

If the slide 108, which ~~for instance~~ is movable in parallel orientation through lateral rolls 111 engaging into the longitudinal groove 83, is moved to the concerned end 73 of a clamped bamboo tube 4, ~~thus~~ the rotational axis of a machining tool 113, which is clamped into ~~the~~ a chuck 112 of the drilling machine 110, remains always coaxial to the longitudinal axis of the bamboo tube 4, which is predetermined by the previously explained clamping.

Page 27, first full paragraph:

The machining tool 113, which acts on the inner and outer ~~side~~ surfaces 75, 76 of the bamboo tube 4 at the same time, is shown in ~~fig.~~ Fig. 14 in a front view. It comprises an inner and an outer cutting tool 114, 115, to which the machining of the inner ~~side~~ surface 75 respectively of the outer ~~side~~ surface 76 of the bamboo tube 4 is allotted.

Page 27, second full paragraph:

The inner cutting tool 114 has the shape of a milling cutter, in particular of a shell end mill, with a backward mounting appendix for clamping it into the chuck 112. ~~This~~ The cutting tool 114 enters ~~into~~ the cavity of a bamboo tube 4 in order to process its inside wall 75, at least in selected areas, to a cylindrical shape.

Page 27, third full paragraph:

Another part is fixed at the shaft of cutting tool 114, which has a bell-shaped form similar to the outer part of the cutting tool 56. Although it could be casted integrally for example, the illustrated embodiment consists of a part shaped like an annular ring 116 at the one hand and at the other hand of a cylindrical part 118 which is fixed to the first.

Page 27, last paragraph:

By means of screws which are penetrating the part shaped like an annular ring 116, ~~this~~ the annular ring 116 is fixed to the cylindrical part 118. At ~~the~~ a front side 119 of ~~the latter~~ port 118, several teeth 120 are cut out, whose edges ~~respectively tips~~ are slightly bent inwards. When feeding the ~~processing~~ machining tool 113, the outer surface 76 of the bamboo tube 4 is machined by these teeth 120 in order to create surfaces which run along lateral surfaces of cylinders, at least in selected areas, and which permit the insertion of the end 73 of a bamboo tube into a corresponding recess 9 of a connection-element 1, 14, 21, 34, 38.

Page 28, first paragraph:

In order to prevent ~~that~~ the cutting tools 114, 115, which ~~as necessary~~ due to an irregular growth act asymmetrically upon the end 73 of the bamboo tube 4 during ~~this~~ machining, ~~may generate~~ from generating vibrations of the machining tool 113, this is additionally supported at ~~the~~ an outer lateral surface 121 of the cylindrical part 118. This is accomplished by another trestle 122 fixed to the supporting profile 78, which is encasing the cylindrical part 118 and comprises several, preferably three or four, rolls 123, which can revolve around rotating axes 124 parallel to the rotational axis of the ~~processing~~ machining tool 113 respectively parallel to the longitudinal axis of the supporting profile 78. The~~se~~ rolls 123 push against the outer lateral surface 121 of the machining tool

113 from different sides, for ~~instance~~ example from directions displaced by 90^0 or 120^0 against each other, so that vibrations are reliably prevented.

Page 28, second paragraph:

When producing bamboo tubes 4 and connection-elements 1, 14, 21,34, 38, 52 fitting into each other, it should be kept in mind that the axial length of an end area 73 of a bamboo tube 4 machined by ablation is equal to, or preferably slightly shorter than, the depth of the annular recess 9 in the concerned connection-element 1,14,21,34,38,52 which should accommodate it, so that the ~~area~~ end 73 of a bamboo tube 4 exposed in this manner, i.e. liberated of its water-repellent coating, is covered by the connection-element 1,14,21,34,38,52 and a layer of glue, or the like as applicable.

Page 28, third paragraph:

Besides bamboo tubes 4, ~~also~~ wooden bars 125, 126, for ~~instance~~ example of weak wood, can be used as bar-elements with the system according to the present invention, ~~which~~ and may either be directly employed as solid wooden bars or can be furnished with a coaxial drilling 127 completely or partly passing through it, ~~for instance~~ in order to favour a crack-free shrinking during ~~the~~ seasoning.

Page 28, last paragraph, continuing onto page 29:

As necessary, such wooden bars 125, 126 can be put together in coaxial alignment for the purpose of elongating them, as shown in fig. 15. For this purpose, the ends of adjoining bars 125, 126, which are to be put together, have embodiments fitting into each other: For example, an annular groove 128 is located at the face side of one bar 125, a complementary annular tongue 129 is located at the face side ~~126~~ of the other bar 126. Together, those form a form-fitting plugging connection, which can be fixed ~~for instance~~ by applying glue at the surfaces of a tongue and groove plugging element 128, 129. ~~Besides, it~~ It is also possible to press or glue one threaded element each into a central drill hole 127 - a threaded nut in the first and a threaded bolt in the other -, so that such bar-elements 125, 126 can ~~also~~ be screwed together- additionally to the formfitting plugging connection.

CLAIM AMENDMENTS

1. (Currently Amended) System comprising bar-elements ~~(4,125,126)~~ joinable to form a truss (5), and ~~connecting~~ connection elements (1,14,21,34,38,52) insertable between the bar-elements ~~(4,125,126)~~ at junctures where two or more bar-elements, whose longitudinal axes are not coaxial to each other, are joined, wherein:

a) each of said bar-elements ~~(4,125,126) consists of~~ comprises at least one portion of a material selected from high-growing plants, and

b) each of said ~~connecting~~ connection elements (1,14,21,34,38,52) ~~consists of~~ comprises a selected rigid, regenerative material; and wherein

c) at least one end of a bar-element ~~(4,125,126)~~, a ~~connecting~~ connection element (1,14,21,34,38,52) which is to be mounted to said bar-element, and at least one end of a further bar-element ~~(4,125,126)~~ which is to be connected to said ~~connecting~~ connection element, ~~are treated to~~ exhibit surfaces configured as geometrical bodies at least in selected areas,

d) such that at a joint between the bar-element ~~(4,125,126)~~ and the ~~connecting~~ connection element or the further bar-element ~~(1,14,21,34,38;4,125,126)~~, each of the bar element and connection element~~s~~ ~~(4,125,126;1,14,21,34,38,52)~~ exhibits at least in a selected area a surface which runs along ~~the~~ a surface (11;76) ~~generated by~~ configured as a selected one of a cylinder, a cone, a prism and a pyramid, as well as at least in another selected area, a surface ~~(11;75)~~ which is configured as a selected one of a hollow cylinder, a hollow cone, a hollow prism and a hollow pyramid, respectively,

e) wherein multiple bar-elements are connected to one connection element (1,14,21,34,38,52) with at least two bar-elements having their longitudinal axes not coaxial to each other, and wherein the connection element (1, 14,21, 34,38,52) comprises at its surface (6,7) multiple connecting structures (3) in the shape of annular recesses (9), each recess (9) surrounding a core (12) and having two concentric bounding surfaces (10,11) for the connection of each bar-element, which bounding surfaces (10,11) ~~which surfaces~~ permit an

assembly by plugging ~~together~~ one bar-element into the annular recess (9) of each connecting structure (3) with closely adjoining surfaces which are complementary to each other and suitable for locking together.

2. (Currently Amended) System according to claim 1, wherein the joint between the bar-element ~~(4,125,126)~~ and the connecting element, or the further bar-element, ~~(1,14,21,34,38;4,125,126)~~ comprises a ~~plug-connection (30)~~ glueing connection.

3. (Currently Amended) System according to claim 1, wherein the joint between the bar-element ~~(4,125,126)~~ and the connecting element or the further bar-element ~~(1,14,21,34,38;4,125,126)~~ comprises ~~a selected one of~~ a clamping ~~(21,34) and a glueing (1,14,38)~~ connection.

4. (Currently Amended) System according to claim 3, wherein for mounting the bar-element ~~(4,125,126)~~ by clamping, a core (23) of the connecting element or the further bar-element ~~(1,14,21,34,38;4,125,126)~~ is spreadable and therefore said core is adapted to be pressed against an inside surface (76) of the bar-element ~~(4,125,126)~~.

5. (Currently Amended) System according to claim 4, wherein an element (31) widening conically, or like the frustum of a pyramid, is moved into an inner, centric ~~cut-out~~ drilling (13) of said core (23), for spreading the core (23).

6. (Currently Amended) System according to claim 5, wherein at least one of the connecting element and the further bar-element ~~(1,14,21,34,38;4,125,126)~~ exhibits ~~a cut-out~~ the drilling (13) penetrating the core (23) in which a shaft of a fastener can be inserted to pull an element (31) with widening cross-section into the core (23).

7. (Currently Amended) System according to claim 1, wherein the ~~connecting~~ connection element (34) exhibits an annular shape (35), so that the ~~cut-outs~~ drillings (13) for the insertion of a screw-like spreading element (27,31) can extend up to the inside (37) of the ~~ring~~ annular connection element (35), in order to apply a threaded element, or other clamping element at this location.

8. (Currently Amended) System according to claim 1, wherein the ~~connecting~~ connection element (1,52) exhibits a discoidal shape with a circular or ring-shaped, or a triangular, quadrilateral or hexagonal base (7,53).

9. (Currently Amended) System according claim 1, wherein one connecting element ~~(1,14,21,34,38,52)~~ exhibits at least one surface area of a shape which generally corresponds to a part of a lateral surface of a hollow cylinder, for connecting to ~~the~~ a shaft of a bar-element ~~(4,125,126)~~.

10. (Currently Amended) System according to claim 1, wherein at least one bar-element ~~(4,125,126)~~ exhibits a shaft milled to a round shape at its outer surface.

11. (Currently Amended) System according to claim 1, wherein a bar-element ~~(4,125,126)~~ which is ~~to be inserted~~ insertable between two ~~connecting~~ connection elements (1,14,21,34,38,52), exhibits ~~a~~ at ~~both~~ ends thereof ~~the~~ surfaces (11;76) configured as a selected one of a cylinder, a cone, a prism and a pyramid arranged ~~either~~ for disposition within or ~~without, respectively, of the~~ around surfaces ~~(11;75), which are~~ on the connection elements configured as a selected one of a hollow cylinder, a hollow cone, a hollow prism and a hollow pyramid in a selected area.

12. (Canceled)

13. (Canceled)

14. (Currently Amended) Process to produce a truss (5) from bar-elements ~~(4,125,126)~~, which are ~~to be~~ joined, and from connecting elements (1,14,21,34,38,52), which are ~~to be~~ placed between the bar-elements at all such joint places, where two or more bar-elements meet whose longitudinal axes are not coaxial to each other, wherein:

a) the bar-elements ~~(4,125,126)~~ are made from at least one segment of a material from high-growing plants each, and

b) the connecting elements (1,14,21,34,38,52) consist of a rigid, regenerative material, and wherein

c) at least one end of a bar-element ~~(4,125,126)~~, a connecting element (1,14,21,34,38,52) which is ~~to be~~ mounted to said bar-element, and the end of a further bar-element ~~(4,125,126)~~ which is ~~to be~~ connected, are treated ~~such that they~~ so as to exhibit surfaces running along well-defined geometrical bodies, at least in selected areas,

d) such that at the joint between a bar-element ~~(4,125,126)~~ and a connecting element or a further bar-element ~~(1,14,21,34,38,4,125,126)~~, each of ~~both~~ the element bodies ~~(4,125,126;1,14,21,34,38,52)~~

exhibits at least in a selected area a surface which runs along the surface (11;76) generated by a cylinder, cone, prism or a pyramid, as well as at least in another selected area a surface (11;75) which runs along a hollow cylinder, hollow cone, hollow prism and or hollow pyramid respectively,

e) wherein multiple bar-elements are connected to one connecting element (1,14,21,34,38,52) with two or more bar-elements having their longitudinal axes not coaxial to each other, and wherein the connecting element (1,14,21,34,38,52) comprises at its surface (6,7) multiple connecting structures (3) in the shape of annular recesses (9), each recess (9) surrounding a core (12) and having two concentric bounding surfaces (10,11) for the connection of each bar-element, whereby the surfaces (11;75) processed in such a way are assembled by plugging ~~them together~~ one bar-element (4,125,126) into the annular recess (9) of each connecting structure (3) with closely adjoining surfaces which are complementary to each other and ~~suitable~~ adapted for locking together.

15. (Currently Amended) Process according to claim 14, wherein the bodies and~~/or~~ the surfaces of the parts ~~(4,125,126;1,14,21,34,38,52)~~ which are to be connected together are processed by cutting.

16. (Currently Amended) Process according to claim 14, wherein both ends (73) of a bar-element ~~(4,125,126)~~ are processed such that the ~~(~~longitudinal~~)~~ symmetry axes of the processed areas (75;76) are in line with each other.

17. (Currently Amended) Process according to claim 16, wherein slots (24) parallel to the longitudinal axis of the concerned ~~plug-connection~~ connecting structures (3), are placed in an area~~,~~ which adjoins the lateral surface (11) of a connecting element or a further bar-element ~~(1,14,21,34,38,52;4)~~, in order to facilitate a radial spring-like movement of ~~(~~areas 25 of~~)~~ the concerned generated surface (11).

18. (Currently Amended) Process according to claim 17, wherein a spreading element (31) is inserted in a ~~bore~~ drilling (13), which is parallel or coaxial to a longitudinal axis of a ~~plug-connection~~ connecting structure (3), in order to permit pressure to be exerted in the direction of ~~(~~areas ~~25~~ of~~)~~ the generated surface tube (75) at the end of a bar-element ~~(4)~~ which is to be connected.

19. (Currently Amended) Process according to claim~~s~~ 14, wherein the bar-elements ~~(4,125,126)~~ are glued or clamped to the connecting elements or further bar-elements ~~1,14,21,34,38,52;4,125,126)~~ after plugging ~~(30)~~ the bar elements and the connection elements together.

20. (Currently Amended) Process according to claim 14, wherein connecting elements (38) are used as end pieces along a longitudinal edge of the truss (5), ~~which~~ and are connectable to a foundation (41), a ceiling, and a roof.

21. (Canceled)

22. (Previously Presented) Process according to claim 14, wherein bamboo culms (4) are used as the bar-elements, whose inner and/or outer lateral surfaces (75,76) at the culms' ends (73) are processed.

23. (Previously Presented) Process according to claim 22, wherein the lateral surfaces (75,76) of the end (73) of a bamboo culm are processed such that the wall-thickness of the culm (4) is equal to or less than a predetermined wall-thickness.

24. (Currently Amended) Process according to claim 23, wherein ~~potentially present~~ diaphragms or ~~(~~nodes~~)~~ in the bamboo culm (4) are pierced or otherwise made passable.

25. (Currently Amended) Process according to claim 22, wherein holes (13) are drilled into a connecting element (1,14,21,34,38,52), which holes lead into a ~~surface~~ core area (12) covered by a face-side of an attached bamboo culm (4), such that ~~said~~ the holes join within the connecting element (1,14,21,34,38,52) in order to ~~obtain a link~~ provide a path between cavities of the attached bamboo-culms (4).

26. (Previously Presented) Process according to claim 25, wherein during creation of the lateral surfaces (75,76) at a connection-element which can be plugged together with a bamboo culm (4), the cavity-joining holes (13) drilled into the connection-element (1,14,21,34,38,52) are used as a tool guide.

27. (Currently Amended) Apparatus to produce a truss (5) from bar-elements ~~(4,125,126)~~, which bar elements are to be joined, and from connecting elements (1,14,21,34,38,52), which are to be placed between the bar-elements ~~(4,125,126)~~ at joint places, where two or more bar-elements ~~(4,125,126)~~ meet whose longitudinal axes are not coaxial to each other,

wherein at least one tool (56,113) comprising a cutting tool, for machining at least one connecting element (1,14,21,34,38,52) made from a rigid, regenerative material and/or the ends (73) of bar-elements ~~(4,125,126)~~ made from at least one segment of a material from high-growing plants each, which are to be mounted to said connecting element or to one another, in such a way that they obtain surfaces (10,11;75,76) which run along well-defined geometrical bodies at least in selected areas, whereby at the processed body ~~(4,125,126;1,14,21,34,38,52)~~ in the area of a joint of a bar-element ~~(4,125,126)~~ with a ~~connecting~~ connection element (1,14,21,34,38) there is formed simultaneously a lateral surface (11;~~76~~) configured as a selected one of a cylinder, a cone, a prism and a pyramid at least in selected areas as well as a surface (~~11;75~~10) configured as a selected one of a hollow cylinder, a hollow cone, a hollow prism and a hollow pyramid at least in selected areas, respectively, the surfaces (10,11) belonging to the same connecting structure (3) in the shape of annular recesses (9), each recess (9) surrounding a core (12) and having two concentric bounding surfaces (10,11) for the connection of each bar-element.

28. (Currently Amended) ~~Apparatus according to claim 27,~~ Apparatus to produce a truss (5) from bar-elements which are adapted to be joined, and from connecting elements (1,14,21,34,38,52), which are adapted to be placed between the bar-elements at joint places, where two or more bar-elements meet and whose longitudinal axes are not coaxial to each other, wherein at least one machining tool (56,113) comprising a cutting tool, for machining at least one connection element (1,14,21,34,38,52) made from a rigid, regenerative material and/or the ends (73) of bar-elements made from at least one segment of a material from high-growing plants, which are adapted to be mounted to said connecting element and to one another, in such a way that they exhibit surfaces (10,11;75,76) which run along well-defined geometrical bodies at least in selected areas, whereby at the processed body in the area of a joint of a bar-element with a connecting element (1,14,21,34,38), there is formed simultaneously a lateral surface (11;76) configured as a selected one of a cylinder, a cone, a prism and a pyramid at least in selected areas, as well as a surface (11;75) configured as a selected one of a hollow

cylinder, a hollow cone, a hollow prism and a hollow pyramid, at least in selected areas, respectively, ~~comprising~~ wherein at least one machining tool (113) for processing the ends (73) of a bar-element ~~(4,125,126), the tool comprising a device~~ comprises grippers (84) for clamping a bar-element ~~(4,125,126)~~ such that both of its ends(73) are substantially parallel and concentrically aligned with a longitudinal axis ~~of the processing apparatus (74)~~, wherein there is provided at least one milling head for machining lateral surfaces at the ends of the bar-elements, to process the inner and the outer surfaces (75,76) of a bar-element simultaneously.

29. (Currently Amended) Apparatus according to claim 28, wherein there is provided a slide device (108) ~~at each end of~~ fixed to the clamping device (84) for ~~holding and/or~~ mounting of a ~~processing~~ machining-tool (113).

30. (Currently Amended) Apparatus according to claim 29, wherein there is provided a roll device (111) to guide the ~~processing~~ machining tools (113) or their holdings ~~(108)~~ respectively in a feeding direction along the longitudinal axis of the processing apparatus (74).

31. (Canceled)

32. (Currently Amended) Apparatus according to claim 27, and further comprising at least one tool (56) for machining a connecting element (1,14,21,34,38,52), wherein the tool (56) is adapted for rotating around an axis (57), with a cutting edge for creating a ~~cavity~~ recess (9) of rotational symmetry with defined cross-sectional area.

33. (Currently Amended) Apparatus according to claim 32, wherein a cutting region is ~~arranged~~ provided at a peripheral boundary surface ~~(64)~~ which surrounds a centrical guiding device ~~(60)~~.

34. (Currently Amended) Apparatus according to claim 33, wherein the centrical guiding device ~~(60)~~ is a drill, so that ~~the~~ a guiding drill-hole (13) and ~~the~~ a plugging cavity (9) can be produced in one work step.